

CLAIMS

1. A battery cell, comprising:
a battery cell structure, said battery cell structure defining a receiving area, a positive alignment opening, and a negative alignment opening;
a compressible stack of battery cell elements in said receiving
5 area, said compressible stack of battery cell elements comprising a plurality of positive plates each having a positive tab portion depending outwardly from a periphery, a plurality of negative plates each having a negative tab portion depending outwardly from a periphery, and a nonconductive separator disposed in between said plurality of positive plates and said plurality of negative plates;
10 and
a cover secured to said battery cell structure covering said receiving area,
said positive alignment opening aligning said positive tab portion of each of said plurality of positive plates, and said negative alignment opening
15 aligning said negative tab portion of each of said plurality of negative plates.
2. The battery cell of claim 1, wherein said cover provides a compressive force to said compressible stack of battery cell elements.
3. The battery cell of claim 1, wherein said receiving area is larger in one or more battery plate growth directions than said compressible stack of battery cell elements.
4. The battery cell of claim 1, wherein said receiving area is smaller one direction than said compressible stack of battery cell elements.
5. The battery cell of claim 1, further comprising one or more apertures on said battery cell structure for receiving a battery electrolyte.

6. An element sleeve for a compressible stack of battery elements, the element sleeve comprising:

a body defining a cavity for receiving the compressible stack of battery elements, said cavity having a height being smaller than an
5 uncompressed height of the compressible stack of battery elements by about 5% to 50%; and

means for compressing the compressible stack of battery elements to about said height of said cavity.

7. The element sleeve of claim 6, wherein the element sleeve is non conductive and acid resistant.

8. The element sleeve of claim 6, wherein said height of said cavity is smaller than said uncompressed height of the compressible stack of battery elements by about 20%.

9. The element sleeve of claim 6, wherein said means for compressing comprises a cover having a plurality of snap lock tabs mateable with a corresponding plurality of recesses in said body.

10. The element sleeve of claim 6, wherein the compressible stack of battery elements has a width and a length that is smaller than a width and a length of said cavity.

11. The element sleeve of claim 10, wherein said body further comprises a plurality of reinforcing ribs for preventing growth of said width and said length of the compressible stack of battery elements larger than said width and said length of said cavity.

12. The element sleeve of claim 6, wherein said body further comprises:

a positive lug alignment slot for receiving a positive lug of at least some of the battery elements of the compressible stack of battery elements,
5 said positive lug alignment slot being offset from a first side of said body by a first predetermined distance and said positive lugs being offset a distance corresponding to said first predetermined distance; and

a negative lug alignment slot for receiving a negative lug of at least some of the battery elements of the compressible stack of battery elements,
10 said negative lug alignment slot being offset from a first side of said body by a second predetermined distance and said negative lugs being offset a distance corresponding to said second predetermined distance, said first predetermined distance being different from said second predetermined distance.

13. The element sleeve of claim 12, wherein said positive lug alignment slot and said negative lug alignment slot further comprise growth insulators for preventing said positive lugs from contacting said negative lugs during growth of the compressible stack of battery elements.

14. The element sleeve of claim 12, wherein said body further comprises a guide for placing and aligning the element sleeve within a battery case such that said positive lugs are adjacent or proximate a positive battery electrode of said battery case, and such that said negative lugs are
5 adjacent or proximate a negative battery electrode of said battery case.

15. The element sleeve of claim 14, wherein said guide comprises a slot or notch.

16. A battery cell, comprising:
a plurality of positive plates each of said plurality of positive plates having a positive lug;
a plurality of separators;
5 a plurality of negative plates each of said negative plates having a negative lug, said plurality of positive plates, said plurality of separators, and said plurality of negative plates being configured into a compressible stack;
a casing for receiving said compressible stack, said casing having an interior height smaller by about 5% to 50% than an uncompressed height of
10 said compressible stack; and
a cover mated with said casing compressing said compressible stack to about said interior height of said casing.
17. The battery cell of claim 16, wherein said plurality of separators are absorbed glass mat separators.
18. The battery cell of claim 16, wherein said interior height of said casing is smaller by about 20% than said uncompressed height of said compressible stack.
19. The battery cell of claim 16, wherein said cover includes a plurality of snap lock tabs mateable with a corresponding plurality of recesses in said casing for mating said cover and said casing.
20. The battery cell of claim 16, wherein said compressible stack has a width and a length that is smaller than an interior width and an interior length of said casing.

21. The battery cell of claim 16, wherein said casing further comprises:

a first slot for receiving said plurality of positive lugs, said first slot being offset from a first side of said casing by a first predetermined distance and said positive lugs being offset a distance corresponding to said first predetermined distance; and

a second slot for receiving said plurality of negative lugs, said second slot being offset from a second side of said casing by a second predetermined distance and said negative lugs being offset a distance corresponding to said second predetermined distance, said first predetermined distance being different than said second predetermined distance.

22. An absorbed glass mat lead-acid battery comprising:

a plurality of battery cells connected to one another in series and/or parallel to provide a current, said plurality of battery cells each having a plurality of positive plates, a plurality of absorbed glass mat separators and a plurality of negative plates configured into a compressible stack, said compressible stack being compressed in a casing by a cover to about an interior height of said casing, said interior height being smaller than an uncompressed height of said stack.

23. The battery of claim 22, wherein said cover includes a plurality of tabs mateable with a corresponding plurality of slots in said casing for mating said cover and said casing.

24. The battery of claim 22, wherein said stack has a width and a length that is smaller than an interior width and an interior length of said cavity.

25. The battery of claim 22, wherein said casing further comprises:

a positive lug alignment slot for receiving a positive lug of said positive plates, said positive lug alignment slot being offset from a first side of said casing by a first predetermined distance and said positive lugs being offset a distance corresponding to said first predetermined distance; and

a negative lug alignment slot for receiving a negative lug of negative plates, said negative lug alignment slot being offset from a second side of said casing by a second predetermined distance and said negative lugs being offset a distance corresponding to said second predetermined distance, said first predetermined distance being different from said second predetermined distance.

26. The battery of claim 22, wherein said an interior height of said casing is smaller than said uncompressed height of said stack by about 20%.